

**PATENT APPLICATION**

**CARD DESTRUCTION SYSTEMS AND METHODS**

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## CARD DESTRUCTION SYSTEMS AND METHODS

### BACKGROUND OF THE INVENTION

[01] This invention relates generally to the field of card destruction. More specifically, the invention relates to automated systems and methods to verify that a card is intended to be destroyed and to produce an audit record of the destruction.

[02] A variety of organizations issue cards to their customers. For example, such organizations may issue credit cards, debit cards, smart cards, loyalty cards and the like to their customers. Often, such organizations contract with another company to produce and mail such cards to the end consumer. For a variety of reasons, once produced some of the cards may need to be destroyed. For instance, some cards may be returned by the postal service as being undeliverable, the customer's account may be closed, or the like.

[03] While such cards can be manually destroyed, such a process is time intensive and can make it difficult to produce reliable records of the destruction. Hence, this invention relates to systems and techniques to facilitate card destruction in a more efficient and reliable manner.

### SUMMARY OF THE INVENTION

[04] In one embodiment, a card destruction system comprises a reader for reading identification information from a card. A controller is coupled to the reader to receive the identification information and to determine whether the card is to be destroyed. A delivery sensor is also coupled to the controller to sense when the card is delivered to a card destruction device. The controller uses the sensed information to produce a record of the destruction. In this way, an automated system is provided to confirm that a card is to be destroyed, to destroy the card, and to confirm that the card was in fact destroyed.

[05] In one aspect, a moving system may be used to move the card through the reader and to the card destruction device. Such a moving system may be constructed of a plurality of rollers that may rotate in opposite directions to move the card through the system. For convenience of manufacture, an AC motor may be used to rotate rollers that are both upstream and downstream of the reader. A DC motor may also be used to rotate rollers that are associated with the reader. In this way, the controller may be used to stop rotation of the reader rollers (by stopping the DC motor) if a card has been read by the reader but a

confirmation that the card is to be destroyed has not been received. In this way, the card is prevented from prematurely passing to the card destruction device. Conveniently, sensors may be provided just before and after the reader to track the location of the card as it enters and exits the reader.

[06] In a further aspect, the system may include a feeding mechanism to feed individual cards from a stack of cards and to the moving system. The feeding mechanism may include a cam that is moved based on a signal from the controller to in turn move a card from the stack and into the moving system.

[07] The card destruction system may also include a switch that is disposed along the moving system downstream of the reader to direct the card to the destruction device or to a holding location depending on the determination from the controller as to whether the card should be destroyed. In a further aspect, the record produced by the controller may include information such as the identification information, a time and date of destruction, the operator monitoring the destruction, and the like.

[08] Hence, in use an operator simply needs to place a stack of cards that are to be destroyed into the feeding mechanism. Cards from the stack are then individually fed into the moving system where their identification information is read and checked to confirm that the cards are to be destroyed. If so, the cards are directed to the card destruction device where a sensor confirms their destruction.

#### BRIEF DESCRIPTION OF THE DRAWINGS

[09] Fig. 1 is a front perspective view of one embodiment of a card destruction system according to the invention.

[10] Fig. 2A is a more detailed view of a left-hand side of the card destruction system of Fig. 1.

[11] Fig. 2B is a more detailed view of a right-hand side of the card destruction system of Fig. 1.

[12] Fig. 3 illustrates a card reader portion of the card destruction system of Fig. 1 with a card reader being disassembled.

[13] Fig. 4 is a more detailed view of the card reader of Fig. 3.

[14] Fig. 5 is a bottom perspective view of the card destruction system of Fig. 1.

[15] Fig. 6 is a detailed view of a sensor employed to sense when a card has been destroyed.

[16] Fig. 7 is a perspective view of a controller employed to control the card destruction system of Fig. 1.

#### DESCRIPTION OF THE SPECIFIC EMBODIMENTS

5 [17] The invention provides systems and methods for destroying cards or presentation instruments. This may include, for example, credit cards, debit cards, phone cards, smart cards, loyalty cards, and the like. Such cards are typically constructed of a plastic material and may be destroyed by shredding devices, cutting devices and the like. However, it will be appreciated that the invention is not intended to be limited to a specific card type or  
10 destruction device.

[18] The systems and methods are automated so that an operator may destroy multiple cards simply by placing them into the card destruction system and actuating the system. The system automatically reads information from the card and then checks a database to confirm that the card is in fact to be destroyed. This information may be read from a mag stripe, a smart card, a label, an embossing, or the like. If a confirmation that the card is to be destroyed is received, the card is delivered to a card destruction device for destruction. Further, final delivery of the card to the destruction device is sensed by a sensor to permit a record to be produced of the destruction. Such a record may include the card number, the account number, the time of destruction, the operator overseeing the destruction, and the like. This record may be maintained in a database so that it may be electronically transmitted to the issuer of the card.

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30 [19] Referring now to Figs. 1, 2A and 2B, one embodiment of a card destruction system 10 will be described. System 10 may conveniently be defined in terms of a card feeding portion 12, a card reading portion 14, and a card disposition portion 16. As best shown in Figs. 1 and 2B, card feeding portion 12 rests on a base 18 and comprises a holder 20 onto which a stack of cards may be placed. Spaced apart from holder 20 is a biasing plate 22 that is biased toward holder 20 by a spring-loaded spool 24 having a length of wire 26 that is coupled to plate 22. In this way, the stack of cards is held between holder 20 and plate 22. As individual cards are removed from the stack, plate 22 moves closer to holder 20 to firmly hold the stack of cards against holder 20. Conveniently, card feeding portion 12 includes a pair of rails 28 between which the stack of cards are placed, and a rod 30 that acts as a guide or track for plate 22 as it moves toward and away from holder 20.

[20] When a stack of cards is placed onto holder 20, the bottom card rests on a roller 32 having a cam (hidden from view). Roller 32 is rotated by a solenoid 34 (see Fig. 5) to cause

the cam to engage the bottom card of the stack. In so doing, the bottom card bends sufficiently to permit the cam to move past the bottom card. After the cam passes the card, the card springs away from the stack and is moved by another roller 36 (see Fig. 3) which moves the card to another pair of rollers 38 and 40 which move the card to card reading portion 14. Hence, card feeding portion 12 is configured to separately introduce individual cards to card reading portion 14. As described in greater detail hereinafter with reference to Fig. 7, a controller 42 is employed to operate solenoid 34 to control the feeding of cards to card reading portion 14. A presence sensor 43 is employed to sense when a card has exited card feeding portion 12 and entered into card reading portion 14. Controller 42 may utilize the information from sensor 43 to reactuate roller 32 in case a card was inadvertently not removed from the stack.

[21] Referring also now to Fig. 3, card reading portion 14 will be described in greater detail. Card reading portion 14 also includes a base 44 along which are disposed various sets of rollers 46, 48, 50, 52, 54, 56, 58 and 60. Rollers 46-60 are arranged in pairs which rotate in opposite directions to move the card in an upright or vertical orientation along base 44. Coupled to base 44 is a lid 62 that includes a card reader 64 which is shown in greater detail in Fig. 4. Conveniently, a set of screws 66 may be used to couple lid 62 to base 44. Various brackets 68 and 70 may be coupled to base 44 to provide openings where screws 66 pass to securely couple reader 64 to base 44.

[22] As the card is moved through card reading portion 14, it passes through a slot 72 in card reader 64. In this way, the information stored on the magnetic stripe of the card is read and passed to controller 42 (see Fig. 7) via an electrical cable 74 (see Fig. 3). Although shown with a card reader that is configured to read magnetic stripes from cards, it will be appreciated that other types of readers may be used, such as, for example, readers for reading smart chips. Cable 74 is employed to transmit the information to controller 42. As described in greater detail hereinafter, this information is used to determine whether or not the card is to be destroyed. A presence sensor 76 is employed to sense the presence of the card after it passes through reader 64. As described hereinafter, sensor 76 may send a signal to controller 42 to indicate the presence of the card at the end of card reading portion 14. In this way, if the controller has not yet determined whether or not the card should be destroyed, the controller may stop operation of rollers 58 and 60 so that the card does not continue to card disposition portion 16.

[23] Card disposition portion 16 includes pairs of rollers 78, 80, 82 and 84 that rotate in opposite directions similar to the other rollers described to continue movement of the card

through card disposition portion 16. Another sensor 86 is employed to sense once the card enters into card disposition portion 16.

[24] Rollers 82 and 84 move the card toward a flipper 88 that pivots back and forth to direct the card either toward a card destruction device or into a holding bin 90 depending on whether or not the card is to be destroyed. Flipper 88 is moved based on operational signals from the controller. If the card is to be destroyed, it is directed by flipper 88 into a chute 92 where it falls through the air into a card destruction device, such as a shredder (not shown). As best shown in Figs. 5 and 6, a phase shift sensor system 94 is disposed to detect when the card falls through the air and into the card destruction device. Sensor system 94 is constructed of a light source 96 and a phase shift reflector 98. An electrical cable 100 is employed to send the sensed signal back to the controller where a record of the card destruction may be recorded.

[25] Referring now to Fig. 5, a bottom view of system 10 is shown. System 10 further includes an AC motor 102 that is coupled to a belt 104 that in turn is used to rotate various rollers of system 10. Motor 102 may be configured to continuously operate so that the rollers in contact with belt 104 continually rotate. More specifically, motor 102 is employed to continuously rotate rollers 38, 40, 78, 80, 82, 84 as well as rollers 106 and 108 in card feeding portion 12. One or more DC motors 110 are employed to rotate belts 112 and 114 to rotate the rollers within card reading portion 14. By utilizing a DC motor, the rollers within card reading portion 14 may easily be stopped, such as when needed if information regarding whether the card is to be destroyed or not has not yet been received back from the controller.

[26] Referring now to Fig. 7, construction of controller 42 will be described in greater detail. Controller 42 includes cabling 116 to permit communication with the various sensors, readers, motors, and the like as previously described. Controller 42 may also include one or more boards 118 to control the operation of various components of system 10. A power supply 120 is also provided to supply power to controller 42.

[27] In operation, a stack of cards is placed into card feeding portion 12 by distancing plate 22 from holder 20. System 10 is then actuated by use of controller 42 which begins operation of AC motor 102 and DC motor 110. Further, the controller causes roller 32 to rotate to dispense a card from the stack where it is grabbed by the various rollers and moved to card reading portion 14. In so doing, sensor 43 detects whether a card has been removed from the stack and advanced to card reading portion 14. If not, controller 42 reactuates roller 32 to supply another card from the stack. As the card passes through reader 64, information is read from the card and passed to the controller 42. Controller 42 then accesses a database (which

may be a remote computer) to determine whether or not the card has in fact been flagged for destruction. If the card reaches sensor 86 before this determination is made, controller 42 stops operation of DC motor 110 to maintain the card within card reading portion 14. Once a decision as to whether the card is to be destroyed or not is made, the card is permitted to pass to card disposition portion 16 where controller 42 controls operation of flipper 88 to direct the card either into holding bin 90 or into chute 92. The cards within bin 90 are those which are not to be destroyed and are permitted to be collected. On the other hand, if the card passes into chute 92 it falls through the air into a card destruction device. As it falls through the air, sensor system 94 senses the presence of the card and sends a signal to controller 42 where a record is made of the destruction. In this way, an audit record is produced to show that the card was actually destroyed. Further, the controller may have an input device where information on the operator is entered so that the record will also have information on the operator running system 10 when the card was destroyed. Controller 42 may also include a timer to record the date and time of the card destruction.

[28] Sensor 86 may also be used to send a signal to the controller to indicate that system 10 is ready to receive another card from the stack. As such, the controller sends another signal to roller 32 to place another card into the system. In this way, the cards are automatically fed from the stack through the reader and to the card destruction device if the cards are to be destroyed. At the same time, a record is automatically created and stored showing the actual destruction of the card.

[29] The invention has now been described in detail for purposes of clarity and understanding. However, it will be appreciated that certain changes and modifications may be practiced within the scope of the appended claims.